

Michał Józef Bogdan

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Academic degrees/titles

- 2020, PhD in Engineering, University of Cambridge
- 2015, MAST in Physics, University of Cambridge
- 2013, Bachelor in physics (speciality: theoretical physics), University of Wrocław

Employment and research history

- III 2024- present: assistant professor, Institute of Mathematics of the Polish Academy of Sciences
- IX 2020- II 2024: assistant professor, Institute of Physical Chemistry of the Polish Academy of Sciences
- 2015-2020: PhD student, Department of Engineering, University of Cambridge
- 2014-2015: student, Department of Physics, University of Cambridge

Short research stays at home and abroad

- March 2022: Fluid-Screen, Beverly, Massachusetts, USA (2 weeks)
- September 2017: Institute Curie, Paris (4 weeks)
- July- September 2014: Department of Engineering, University of Cambridge
- July 2013: Joint Institute for Nuclear Research, Dubna, Russia (3 weeks)
- May- July 2013: Institute of Low Temperatures of the Polish Academy of Sciences

Selected lectures and presentations

- 6th International Soft Matter Conference, Poznań (Poland), September 2022, lecture titled: "Effective crystallization in confined soft granular media"
- American Physical Society March Meeting, Chicago (USA), March 2022, lecture titled: "Stochastic Jetting and Dripping in Confined Soft Granular Flows"
- American Physical Society March Meeting, online conference, March 2021, lecture titled: "Disordered hyperuniformity, memory and information coding in droplet chains"
- American Physical Society, Division of Fluid Dynamics, Atlanta (USA), November 2018, lecture titled: "Fingering instabilities in tissue invasion: an active fluid model" and poster titled: "Errors in Energy Landscapes Measured with Particle Tracking" (received a grant from the American Physical Society to participate in the conference)
- Gordon Research Seminar, New London (New Hampshire, USA), August 2017, lecture titled "Continuum Model of Multicellular Fingering in Cancer Metastasis"

Grants and awards

- The Miniatura Grant awarded by the Polish National Science Center for the project titled "Developing a platform for the controlled production of densely packed soft granular clusters", September 2022
- Awarded the so-called PD2PI Fellowship, a post-doc financed from the European Union's "Horizon 2020" programme, as part of Marie Skłodowska-Curie actions, April 2020
- Research Studentship by the Cambridge University Philosophical Society, 2019
- Travel Grant from the American Physical Society to participate in the American Physical Society Division of Fluid Dynamics Meeting, 2018
- Cambridge European Scholarship, 2015-2018
- The Eastern European Bursary, awarded by Trinity College, Cambridge, 2014-2015
- The Scholarship of the Minister of Science and Higher Education for scientific achievement, awarded twice (2011, 2013)
- The Scholarship of the Rector of the University of Wrocław, awarded twice (2011, 2013)

Academic teaching experience

- 2022- 2023: Supervised preparation of a master thesis of Leon Jurkiewicz titled: "Gęste emulsje podwójne w układach mikroprzepływowych: chemiczne i fizyczne warunki stabilności i kontroli"
- Department of Physics, University of Cambridge- exercise sessions (aka supervisions) in the following courses: Thermodynamics (2020-2021), Soft Condensed Matter (2019)
- Department of Engineering, University of Cambridge- exercise sessions in the following courses: Mathematical Biology of the Cell (2019), Mathematical Methods (2017)

Non-academic employment experience

- Consulting services, Immersive sp. z o.o., 2021- 2023
- Data Scientist, Montec sp. z o.o., December 2019- May 2020
- Commercial individual teaching of physics and mathematics for talented high school students, the Swan School, 2016- 2018

Publications in journals

1. **Michał Bogdan**, Jesus Pineda, Mihir Durve, Leon Jurkiewicz, Sauro Succi, Giovanni Volpe, Jan Guzowski, *Crystallization and topology-induced dynamical heterogeneities in soft granular clusters* (**2024**), Physical Review Research, in print, accepted in June 2024 (arxiv: <https://arxiv.org/abs/2302.05363>)
2. Katarzyna O. Rojek, Antoni Wrzos, Stanisław Żukowski, **Michał Bogdan**, Maciej Lisicki, Piotr Szymczak, Jan Guzowski, *Long-term day-by-day tracking of microvascular networks sprouting*

in fibrin gels: From detailed morphological analyses to general growth rules, [APL Bioeng.](#) 2024 Mar; 8(1): 016106, doi: [10.1063/5.0180703](https://doi.org/10.1063/5.0180703)

3. **Michał Bogdan**, Andrea Montessori, Adriano Tiribocchi, Fabio Bonaccorso, Marco Lauricella, Leon Jurkiewicz, Sauro Succi, Jan Guzowski, *Stochastic Jetting and Dripping in Confined Soft Granular Flows (2022)*, Physical Review Letters, Vol. 128, Issue 12 — 25 March 2022, DOI: <https://doi.org/10.1103/PhysRevLett.128.128001>
4. Mihir Durve, Adriano Tiribocchi, Fabio Bonaccorso, Andrea Montessori, Marco Lauricella, **Michał Bogdan**, Jan Guzowski, and Sauro Succi, *DropTrack—Automatic droplet tracking with YOLOv5 and DeepSORT for microfluidic applications (2022)*, Physics of Fluids, volume 34, pages 082003, DOI: <https://doi.org/10.1063/5.0097597>
5. Andrea Montessori, Adriano Tiribocchi, **Michał Bogdan**, Fabio Bonaccorso, Marco Lauricella, Jan Guzowski, Sauro Succi, *Translocation Dynamics of High-Internal Phase Double Emulsions in Narrow Channels (2021)*, Langmuir, 37, 30, 9026–9033, DOI: <https://doi.org/10.1021/acs.langmuir.1c01026>
6. **Michał Bogdan**, Thierry Savin, *Fingering instabilities in tissue invasion: an active fluid model (2018)*, Royal Society Open Science, 5(12):181579, DOI: <https://doi.org/10.1098/rsos.181579>
7. **Michał Bogdan**, Thierry Savin, *Errors in Energy Landscapes Measured with Particle Tracking (2018)*, Biophysical Journal, 115(1):139–149, DOI: [10.1016/J.BPJ.2018.05.035](https://doi.org/10.1016/J.BPJ.2018.05.035)
8. Tadeusz K. Kopeć, **Michał Bogdan**, *Berezinskii–Kosterlitz–Thouless transition in two-dimensional arrays of Josephson coupled Bose–Einstein condensates (2013)*, Physics Letters A, 377(18):2581–2584, DOI: [10.1016/J.PHYSLETA.2013.08.013](https://doi.org/10.1016/J.PHYSLETA.2013.08.013)

Conference papers

1. Jesus Pineda, **Michał Bogdan**, Jan Guzowski, Giovanni Volpe, *Unveiling the complex dynamics of soft granular materials using deep learning (2023)*, Emerging Topics in Artificial Intelligence (ETAI), August 2023, Paper 12655-61